x[th] International Symposium on Vulcanospeleology

September 9 -15, 2002 Reykjavík, Iceland

- Greg Middleton

Dr Bill Halliday, founder and Hon. President, CVC

International symposia on volcanospeleology have been organised by the IUS Commission on Volcanic Caves since 1972 (Washington, USA), averaging one every three years. Recent meetings have been in Nairobi, Kenya (1998) and Catania, Sicily, Italy (1999). 2002 was to be Reykjavik's turn – hosted by Hellarannsóknafélag Íslands (the Icelandic Speleological Society).

Iceland is just under twice the size of Tasmania, but it has only a little over half the population (270,000) so it's not very surprising that its caves (mostly of volcanic origin – whether in lava or in ice - caused by geothermal heat under glaciers) have mostly been studied by foreigners. ISS, however, under its energetic Chair, Sigurður Jónsson ('Siggi'), is making great strides in finding, surveying and protecting the island's wealth of vulcanospeleological treasures.

'Siggi' Jónsson and Dr Chris Wood, noted British vulcanospeleologist

Quite remarkably, this symposium was overrun by Australians (John Brush, Marjorie Coggan, John and Jeanette Dunkley, Ken and Janeen Grimes, Julia James, Ruth Lawrence, David Wools-Cobb and the author). Next best represented was Portugal, or to be precise, the Azores, and Iceland, with 6 each, UK and Japan 3, USA 2, and Switzerland, Italy, Saudi Arabia and the Netherlands, with 1 each.

The symposium proper was held at the Grand Hotel, Reykjavik, but there were plenty of opportunities to get out and see the countryside - and to get beneath it.

Kristján Sæmundsson, renowned Icelandic geologist, set the scene with an overview of the volcanic geology of Iceland.

The Commission's founder, Bill Halliday, provoked us by asking just what is a lava tube? He proposed a serious attempt at developing a clear definition of the term. Bill also reported on his work in the crevice caves of the 'Great Crack' on the side of Kilauea volcano, Hawaii and (for D. & H. Medville) on their investigation of patterns of lava tube development on the north flank of Mauna Loa, Hawaii.

Julia James observed that little work has been done on air quality in lava tubes and that a total analysis of the air needs to be done to help establish the source of the major problem gas, carbon dioxide. Bayliss Cave at Undara, Australia's longest lava tube, has high carbon dioxide levels, which have challenged explorers.

Ruth Lawrence reported on her recent investtigations in Samoa, identifying as many volcanospeleological features as possible and particularly looking at the role of local villages in cave tourism.

Arni Stefánsson gave three papers (history of lava cave preservation in Iceland – which chronicled some sad cases of wanton destruction, topography of lower Hallmundarhraun and five vertical conduits in Iceland), as well as a remarkably moving slide presentation ('Iceland above and below'), spanning his many years of lava cave (and surface) exploration in Iceland and his efforts to ensure the caves' conservation.

Chris Wood reported on his investigations into the World Heritage potential of volcanic landforms and the extensive lava tubes of Cheju Island, South Korea. Chris also summarised the findings of the 2000 and 2001 Laki expeditions in the south of Iceland, and his work with a caesium magnetometer on the large tubes of the Hallmundarhraun which has detected large entranceless voids beyond the known caves. (There was serious talk later of getting drilling equipment to the site to put down test bores with the hope of some day opening up these otherwise inaccessible tubes.)

Other presentations were by Tsutomu Honda (on discharge mechanisms of lava tubes and on lava stalactites in hollow tree molds on Mt Fuji); by John Pint (for M.A. Alshanti) on the geology of Harrat Kishb, Saudi Arabia (a 5890 sq. km. lava flow with numerous lava tubes) and accounts of expeditions to find and survey these lava tubes (one of which contained 'guanomites' – stalagmites composed of rock-dove guano!); by our own Ken Grimes on subcrustal drainage of lava tubes, based on examples from Mount Eccles, Victoria, and on a cave in a basalt dyke at Mount Fyans, Victoria; by Manuel Costa from the Azores on plans for the development of the Gruta das Torres on Pico Island as a show cave (actually 400 m of a known 5150m) and Joao Nunes on plans for

development of Carvao Cave as an educational resource; by Jakob Guðbjartsson and Siggi on *hyalocaves* in Iceland – these are a newly-recognised phenomenon associated with sub-glacial volcanic eruptions, they result from the entrapment of large blocks of ice inside or on top of volcanically generated gravity flows and pillow lavas; Siggi also presented on the mapping history of Surtshellir/Stephánshellir system, on 25 years of Icelandic cave surveying and on conservation of volcanic caves in Iceland; F. Petralia from Sicily described an unusual lava tube formed in submarine pillow-breccia; P. Borges from Azores explained how endemic arthropods had been used to evaluate the conservation value of Azores caves and how the most beautiful caves are also the most diverse in troglobites.

Cave databases were the subject of papers by both James Begley (for Iceland) and Joao Constancia et all. (for Azores). Clearly all sorts of databases can be designed, but it's the information that's put into them and how it can be manipulated that determines how useful they are.

I showed photos from my recent trip to document the lava caves of Samoa and Gerald Favre from Switzerland showed two of his excellent caving videos, one featuring an attempt to do a through trip in a geothermal glacier cave with high carbon dioxide in Vatnajökull.

The program was nicely wrapped up with an excellent banquet on the tiny island of Viðey.

Fine display of lava stalagmites – and stalactites - Arnahellir

Field excursions

On the first day of the symposium (10 September) there was an afternoon excursion to the Reykjanes Peninsula with excellent geological commentary by Kristján Sæmundsson and Siggi Leiðarendi cave on the Skúlatúnshraun (flow) was visited after a walk of a hundred metres or so across moss-covered lava in light rain. The name translates as "path end". The cave contains a wealth of long black lava stalagmites.

We then visited a geothermal power station near Grindavik and were given a run-down on its operation by the company's PR man – an enthusiastic exponent of the benefits of this clean power source (especially in a country with few alternatives). In the basement we viewed an extraordinarily good series of displays explaining the geology and geothermal processes, complete with a powerful recording of an earthquake converted into the audible range. We were then given the opportunity to enjoy what the Lonely Planet guidebook (Swaney 1997) describes (accurately) as a "chemical waste dump" – "a pale blue pool of effluent from the Svartsengi power plant (which is fuelled by seawater that has been heated after seeping beneath the lava). Algae thrives in the 70°C, 18% saline water that emerges from the pipes but, as the water cools in the air, the algae dies, leaving a sort of organic soup." Some people passed up the opportunity, but most enthusiastically plunged in and apparently enjoyed it.

On 13 September there was an all-day excursion around the south-west of the island. Highlights were views over Lake Pingvallavatn and surrounding volcanic features, the site of the world's first parliament, the Alðingi; the Tintron Hornito, the geysers and hot pools of Geysir, Gullfoss (one of Iceland's many spectacular waterfalls) and a visit to Arnahellir. ISS has gated this cave which only a couple of months before had been declared a national monument – and, especially for our visit, they had provided some brilliant illumination.

Dr. Julia James descending through the gate, Arnahellir

Although not a large lava cave, it contains an extremely fine gallery chock full of large lava stalactites and stalagmites – certainly the best display I've yet seen in a single chamber.

A further (long) day excursion took place on 15th, when the Hallmundarhraun (lava field) was visited, about 100 km north-east of Reykjavik. Participants visited parts of three classic Icelandic lava tube caves, Surtshellir, Stefánshellir and Viðgelmir. The photographers couldn't get enough of the ice formations – though they were clearly, at the end of summer, somewhat the worse for wear. A couple of people made it the whole length of Viðgelmir, about 1500 m – and managed a few photos on the way. The Commission's Chairman, Jan Paul van de Pas, was particularly pleased to get to see this cave as he had only visited the entrance chamber as a tourist some years before – for a fee he says was higher than for any other tourist cave! Although a very large number of this cave's lava stalagmites have been broken - by, it has been suggested, natural causes (Van de Pas 2002) – enough remain in the huge passage to make this one of the classic lava caves.

Next day a large proportion of the participants headed off into the centre of the island for a three-day excursion to the north-east – Myvatn area. Highlights of this were the drive through the black desert-like plains with glaciers and volcanoes on either side, the waterfalls Aldeyjarfoss over

columnar basalt and Godafoss, Myvatn (a lake surrounded by volcanic features), relaxing in the hot (45°C) waters of Vogagja fissure cave, the Krafla 1974 lava flow with hot springs, steam vents and hornitos and, to top it all, the spectacular ice decorations of Lofthellir ("air cave" – found by Siggi a few years ago by flying over the area).

Ice formations in Lofthellir

Commission Meeting

At the formal meeting of the Commission the offer from the Azores to host the next meeting in 2004 was enthusiastically accepted.

Concern was expressed at the failure of the Catania (1999) proceedings to appear; they are in the hands of the organisers. Chairman Van de Pas offered to step down but as there were no other takes for the job he will continue until someone suitable can be found. The unreasonable demand by IUS for a US$3/head fee to endorse meetings of commissions, etc was rejected and a formal request is to be sent to IUS to discontinue it. To facilitate communication Siggi offered to investigate the setting up of an email list. There was a round table discussion on matters such as sharing and controlling information, databases and numerical assessment of caves. There was in-principle support for the Korean World Heritage nomination for Cheju but it was felt that more thorough documentation was required. The symposium proceedings may be provided on CD in pdf format

Chris Wood, James Begley and the author, accompanied at times by Arni Stefánsson and Jakob Guðbjartsson, enjoyed a few extra days caving on Snaefellsnes (the peninsula with the volcano immortalised by Jules Verne as the stepping-off point for the 'Journey to the Centre of the Earth'). The spectacular, if small, icecap of Snaefellsjökull provides a great backdrop to some interesting shield volcanoes, lava flows, lava tubes, hornitos, etc.

REFERENCES

SWANEY, D. 1997. *Iceland, Greenland and the Faroe Islands.* Lonely Planet: Hawthorn, Vic. 3rd Edn, 628pp.

VAN DE PAS, J.P. 2002 Iceland, September 2002. *Commission on Volcanic Caves Newsletter,* #37 (Oct. 2002):5-6.

"BOOK" REVIEW

Yarrangobilly Caves House Precinct – Draft Conservation Management Plan. NSW National Parks and Wildlife Service, Cultural Heritage Division. Published on CD Rom, March 2002. Reviewed by Elery Hamilton-Smith.

This draft plan has just been released for public comment, which must be forwarded by 23rd December. The editor's deadline means that there is not time for a critical review, so this is simply a note in order to draw attention that it is formally on public exhibition. Doubtless, further copies are available from the South West Slopes Regional Office (P.O. Box 472, Tumut, NSW 2720; Phone 02.6947.7000).

It is a remarkably comprehensive collation of historical and other information, extensively illustrated with historic photographs and plans. In brief, it is an invaluable reference document on Yarrangobilly.

There are certainly some omissions, such as the extent to which Caves House was a favoured venue for the educated gentry to spend their regular fishing holidays. But probably the most important is the story of when Brian O'Brien was lost in East Deep Creek Cave during December 1953.

This was not only a significant event in itself, but played a crucial role in the evolution of Australian speleology from that time forwards. Similarly, there is no reference at all to the important role of Jim and Alice Butler who arrived in the following year and stayed for many years, doing a great deal to maintain the operation of the caves under considerable difficulties and to help shape the relationship between speleological groups and land managers.

But the omissions vanish into in significance when one looks at the overall comprehensiveness of the document. It demands and will doubtless get some careful editing and re-arrangement before being finalised. Those responsible deserve thanks and congratulations.